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=> d his

     (FILE 'HOME' ENTERED AT 11:47:18 ON 19 OCT 2004)
     FILE 'CA' ENTERED AT 11:47:35 ON 19 OCT 2004
L1   47915 S EXPERIMENT?(3A)(DESIGN? OR SETUP OR PROCESS)
L2    2717 S L1 AND(COMPUTER OR PROCESSOR OR MICROPROCESSOR OR AUTOMAT?)
L3     283 S L1 AND(COMPUTER OR PROCESSOR OR MICROPROCESSOR OR AUTOMAT?)(5A)
           CONTROL?
L4      54 S L1 (5A)(COMPUTER OR PROCESSOR OR MICROPROCESSOR OR AUTOMAT?)(5A)
           CONTROL?
L5     114 S L3 AND(OPTIMI? OR SYNTHE? OR LIQUID OR SOLUTION OR FLUID OR
           SAMPLE)
L6    2362 S L1 AND FACTORIAL
L7     774 S L6 AND(TEMPERATURE OR L2)
L8     346 S L7 AND(COMPOSITION OR CONCENTRATION)
L9      44 S L8 AND(SAMPLE OR SOLUTION OF LIQUID OR FLUID)
L10    302 S L8 NOT L9
L11      2 S L10 AND(EXPERT? OR PHASE DIAGRAM)
L12  39159 S (COMPUTER OR PROCESSOR OR MICROPROCESSOR OR
           AUTOMAT?)(5A)CONTROL?
L13   2283 S (COMPUTER OR PROCESSOR OR MICROPROCESSOR OR AUTOMAT?)(5A(HEATER
           OR HEATING OR TEMPERATURE)(6A)(CONTROL? OR CHANG? OR VARIATION)
L14     38 S L2 AND(SAMPLE OR SOLUTION OR LIQUID OR FLUID)(6A)(CHARACTERI? OR
           PROPERTY)
L15     33 S L13 AND(SAMPLE OR SOLUTION OR LIQUID OR FLUID)(10A)(CHARACTER?
           OR PROPERTY)
L16   2030 S L12 AND L13
L17    251 S L16 AND(COMPOSITION OR CONCENTRATION)
L18     83 S L17 AND(PH OR FLUORESC? OR COLOR? OR SHEAR? OR VISCOS? OR
           CONDUCTIVITY OR RESISTIVITY OR RESISTANCE)
L19  84826 S (PHASE OR PROPERTY OR PARAMETER)(3A)(DIAGRAM OR GRAPH OR PLOT OR
           GRAPHIC OR DISPLAY?)
L20      4 S L17 AND L19
L21     85 S L12-13 AND L19
L22    431 S L4-5,L9,L11,L14-15,L18,L20-21
L23    328 S L22 NOT PY>1998
L24    294 S L23 NOT(CEMENT OR CARS OR ALLOY OR FLASH PHOTOLYSIS OR MHD OR
           SOIL)
L25    276 S L24 NOT(ATOMIC ABSORPTION OR NUCLEAR SPIN OR GAS MIXTURE OR
           MACERI? OR ORE OR DIAMOND OR DOT GLASS OR COAL)
L26    262 S L25 NOT(DIFFRACT? OR COMBUST? OR EXTENSIBLE OR SEDIMENT OR
           MICROGRAV? OR IMAGE STICKING OR STORAGE RING)
L27    248 S L26 NOT(ATOMIZ? OR SEEBECK OR NEON OR SAUSAGE OR DTA OR RARE
           EARTH OR ZONE REFINING OR FLAME)
L28     14 S L26 NOT L27
L29      1 S L28 AND DYE
L30    225 S L27 NOT(SLUDGE OR PHOTONUCL? OR CRYSTALLIZER OR POWDER INJECT?
           OR CRYSTAL GROWTH OR FALLING DROP OR CAPSULE OR CRYOGEN? OR
           PHOTOCONDUCT? OR STEEL MANUFACT? OR MINERAL)
L31     23 S L27 NOT L30
L32      1 S L31 AND MATERIALS/TI
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L33 201 S L30 NOT(WATER SOFTENING OR CERAMIC OR STRIPPING OR COKE OR ROTATING HEAD OR HOLOGR? OR THERMIONIC OR PZT OR SINK OR NOISE OR FUEL GAS)
L34 182 S L33 NOT(CYTOM? OR KIDNEY OR RBMK OR DIELECTRIC OR NATURAL GAS OR MUSCLE OR NUCLEAR REACTOR OR PYROLYSIS)
L35 184 S L29,L32,L34

=> d bib,ab 1-184

L35 ANSWER 19 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 126:148384 CA
TI Optima: a Windows-based program for **computer**-aided **optimization** of **controlled**-release dosage forms
AU Lu, D. Robert; Abu-Izza, Khawla; Chen, Wei
CS Coll. Pharmacy, Univ. Georgia, Athens, GA, 30602, USA
SO Pharmaceutical Development and Technology (1996), 1(4), 405-414
AB The purpose of this work was to develop a **computer** program that assists **optimization** of **controlled**-release devices, both visually and math., using response surface methodol. (RSM). A Windows-based computer program, Optima, which interactively implemented a no. of subroutines for the **optimization** procedure, was developed. Optima is an integrated, user-friendly, and graphically oriented program for pharmaceutical dosage form **optimization**. Central composite design is implemented in the program. First- and second-order models contg. up to five variables can be fitted to the data. The user can also choose between linear and exponential individual desirability functions, and use them to construct an overall desirability function that combines all the response variables in a single response. The program can predict the optimum levels of exptl. variables, with respect to individual responses and/or the overall desirability. Optima has been successfully used in the development of sustained-released AZT-loaded microspheres. During the **optimization process**, three **exptl.** variables were investigated and four responses were measured. The **exptl. design** was a central composite design that was generated by the program. The response values were used by the program to calc. the individual desirability functions, which were then combined into an overall desirability function. The individual responses as well as the overall desirability function were **optimized** by fitting to a second-order polynomial equation. The response surface were generated and optimum levels of the exptl. variables were predicted. The obsd. responses of the **optimized** formulation were very close to those predicted by Optima. The program proved to be a very useful, integrated tool for **optimization** of the controlled-release microspheres.

L35 ANSWER 20 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 126:48820 CA
TI Real-time, sensor-based computing in the laboratory
AU Badmus, O. O.; Fisher, D. Grant; Shah, Sirish L.
CS Univ. Alberta, Edmonton, AB, T6G 2G6, Can.
SO Chemical Engineering Education (1996), 30(4), 280-285, 289
AB Specific control applications using personal computers, com. process

computer process-computer interfaces, simple processes, and Matlab/Simulink software are described in enough detail that they can be replicated by others. The real purpose of this paper, however, is to demonstrate the importance of real-time, sensor-based (RTSB) computing and how it can be easily and effectively integrated into university student labs. The paper describes: the **exptl. processes** used in our undergraduate **computer** process **control** lab., the process instrumentation and process-computer interface, the computer and communication systems, and typical software (operating system, application, and process control).

L35 ANSWER 24 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 124:317822 CA
TI Automation and **optimization** of glycine **synthesis**
AU Fauduet, Henri; Nikravech, Mehrdad; Porte, Catherine
CS Laboratoire de Chimie Bioorganique et Analytique, URA 499, BP 6759, 45067, Orleans, Fr.
SO Process Control and Quality (1996), 8(1), 41-53
AB Glycine was **synthesized** in an aq. medium through ammonolysis of monochloroacetic acid with hexamethylenetetramine as a catalyst. The automation of the process was performed on a lab. scale with the Logilap®system. This system allowed to **optimize** the influence of temp. and pH on the yield of the reaction. Research on the optimum yield was carried out using the **exptl. design** method. The first-order design was not suitable but the second-order design allowed to calc. the best conditions for obtaining the optimum yield from exptl. results. The correlation design and the three-dimensional space diagram led us to infer that a yield superior to 93% could be obtained when the reaction was achieved with a temp.

L35 ANSWER 31 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 123:94695 CA
TI Low temperature calorimetry for weakly interacting molecular systems
AU Matsuo, Takasuke
CS Dep. Chemistry Microcalorimetry Res. Center, Osaka Univ., Osaka, 560, Japan
SO Pure and Applied Chemistry (1995), 67(6), 911-18
AB With development of small-sample calorimeters and their **computer control**, adiabatic low **temp**. calorimetry has become one of the diverse exptl. methods for studying more general low temp. properties of matter. A device to increase the efficiency of the calorimetric expt. is described. Calorimetric studies of deuterium-induced phase transitions, for which recent development of the exptl. technique was essential, are reviewed. Substances discussed are ammonium hexachlorometallates, rubidium hydrogen selenate, 5-bromo-9-hydroxyphenalenone, and their deuterated analogs.

***L35 ANSWER 35 OF 184*** CA COPYRIGHT 2004 ACS on STN
AN 122:197707 CA
TI Automation of **phase diagram** recording
AU Rouse, J.; Adamy, S. T.; Mehrteab, A.; Broze, G.

CS Technol. Cent., Colgate-Palmolive Co., Piscataway, NJ, 08855, USA
SO Journal of the American Oil Chemists' Society (1995), 72(1), 37-42
AB An automated titrn. system was developed for generating data to construct **phase diagrams**, which are extremely useful in the development of personal and household products. The authors describe the system and how it can be used to perform dual titrn. A clear microemulsion sample is titrated with an oil until the dispersion turns cloudy (defined to be a transmittance < 90%). This mixt. is then dosed with a certain quantity of cosurfactant, more than enough to clear the mixt. The sample is again titrated with oil. This process continues until the sample no longer clears upon adding cosurfactant. The resulting measurements of oil uptake can be used to characterize the boundaries of the L1 or oil-in-H2O microemulsion region of the phase space. Expts. for up to sixteen samples can be performed, each having individual setup and operating instructions. Features include completely **automated** operation, **computer-controlled** 2-speed mixing, viscosity detection at the end-point condition, and the storage of results in a computerized format.

L35 ANSWER 38 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 122:10925 CA
TI Online copolymer composition control in the semicontinuous emulsion copolymerization of ethyl acrylate and methyl methacrylate
AU Leiza, Jose R.; de la Cal, Jose C.; Meira, Gregorio R.; Asua, Jose M.
CS Dep. Quim. Apl., Univ. Pais Vasco, San Sebastian, 20080, Spain
SO Polymer Reaction Engineering (1993), Volume Date 1992-1993, 1(4), 461-98
AB A closed-loop strategy for copolymer compn. control in a semicontinuous emulsion polymn. system is presented. This strategy is based on a nonlinear adaptive plus proportional-integral controller that calcs. the flow rate of the more reactive monomer to be added into the reactor to produce a copolymer of a given compn. The nonlinear adaptive part of the controller is based on a simplified math. model of the process that includes an online adjustable parameter. The controller was checked by computer simulation and also exptl. verified during the semicontinuous emulsion copolymn. of Et acrylate and Me methacrylate carried out in a **computer controlled exptl. setup** using both purified and tech. grade monomers.

L35 ANSWER 40 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 121:159849 CA
TI A rapid routine instrument for detecting nascent sedimentation and creaming in emulsions and suspensions
AU Meunier, Gerard
CS Formulation, Castanet-Tolosan, F31320, Fr.
SO Comunicaciones presentadas a las Jornadas del Comite Espanol de la Detergencia (1994), 25, 579-93
AB TURBISCAN is equipped with a transmission/reflexion IR light detector (860 nm) which scans the entire height of a flat-bottomed tube. It measures a large scale of turbidity (from abs. clearness to max. opaqueness) throughout the sample. It can perform 2000 acquisitions

per scan in < 3 s (i.e. 1 acquisition each 40 μm). TURBISCAN is monitored by a personal computer. It can **automatically control** up to 100 pre-programmed readings, processed through WINDOWS (smoothing, superposition, zoom, shifting, etc.). Used for small vols. (7 mL) of concd. and opaque emulsions or suspensions, it detects nascent demixing phenomena (such as sedimentation, creaming or phase sepn.) over 4 times quicker than the naked eye, with better accuracy and reproducibility. Moreover, TURBISCAN is non-destructive, non-intrusive and can be fully automated. TURBISCAN is a high-performance tool for studying stability, soly., and **phase diagrams**.

L35 ANSWER 44 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 120:109727 CA
TI Correlations for viscosity of kraft black liquors at low solids **concentrations**
AU Zaman, Abbas A.; Fricke, Arthur L.
CS Dep. Chem. Eng., Univ. Florida, Gainesville, FL, 32611, USA
SO AIChE Journal (1994), 40(1), 187-92
AB The kinematic viscosities of several kraft black liquors from a 2-level, 4-variable, **factorial-designed expt**. for pulping slash pine were detd. for solids **concns**. from 10 to 50% and **temps**. ≤ 80° by glass capillary methods. The 4 pulping variables were cooking time, cooking **temp**., sulfidity, and effective alkali. Relationships between **temp**. and kinematic viscosity were developed by using free vol. and abs. rate theories. The results from these 2 methods were compared and discussed. A reduced variables method for dil. polymer solns. was used to correlate the viscosity with the combined effects of **temp**. and solids **concn**. The purpose of the study was to evaluate the utility of various fundamentally based models for correlating viscosity data of black liquors as a function of **temp**. and **concn**. of nonvolatile components in the region in which the liquors behave as Newtonian **fluids**.

L35 ANSWER 50 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 119:170326 CA
TI Computer-controlled system designed to measure photodegradation of photochromic compounds
AU Dubest, R.; Levoir, P.; Meyer, J. J.; Aubard, J.; Baillet, G.; Giusti, G.; Guglielmetti, R.
CS Inst. Topol. Dyn. Syst., Univ. Paris, Paris, 75005, Fr.
SO Review of Scientific Instruments (1993), 64(7), 1803-8
AB The authors describe a new, entirely computer-controlled app. designed for degrdn. studies of photochromic compds. Photodegrdn. can be performed in three different ways using, in addn. to the usual flash mode, the cyclic and continuous modes which more closely simulate daylight exposure conditions. In each mode, the "fatigue resistance" parameter is computed. Moreover, the spectro-kinetic parameters of photomerocyanine species can be obtained from the kinetic mode. Due to the fully **computer-controlled exptl. setup**, the between-day reproducibility of the initial absorbance and fatigue resistance detns. are better than 4% and 6%, resp. Owing to the modular design of the

menu-driven software, written in C language, the app. is very flexible and easy to use.

L35 ANSWER 51 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 119:84703 CA
TI Development of an **expert** system for selection of **experimental designs**
AU Olivero, Ramon A.; Seshadri, Sridhar; Deming, Stanley N.
CS Lockheed Environmental Systems and Technologies Company, Las Vegas, NV, USA
SO Analytica Chimica Acta (1993), 277(2), 441-53
AB An **expert** system has been developed to assist chemists in the selection of **exptl. designs** for research projects. The system (named DXPERT) ranks thirteen types of **exptl. designs** according to their suitability for projects presented by users in an interactive session. Design categories included are **factorial**, response surface, sequential simplex optimization, simplex mixt., and statistical testing. A desirability index is assigned to each design alternative according to project characteristics (attributes). Characteristics are interpreted based on **expert** knowledge built into the system. DXPERT uses math. concepts to mimic features of human intuition and decision making. **Expert** knowledge is represented by relevance factors (a no. between minus one and plus one) in a multiple-alternative multiple-attribute table. Relevance factors are interpreted as fuzzy values that represent the degree to which a design belongs to the set of suitable designs. The formula for calcg. design desirabilities is based on fuzzy mathematics. For efficiency purposes, the order of the questions presented to the user is driven by a max. potential information gain algorithm. Design desirability indexes were found to be useful to researchers for the elimination of unsuitable designs and **concn.** of further efforts in the most applicable designs. A validation test was conducted with the participation of four other **experts** in the field.

L35 ANSWER 57 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 118:80695 CA
TI Application of an automated chemistry workstation to problems in **synthetic** chemistry
AU Corkan, L. Andrew; Plouvier, Jean Christophe; Lindsey, Jonathan S.
CS Dep. Chem., Carnegie Mellon Univ., Pittsburgh, PA, 15213, USA
SO Chemometrics and Intelligent Laboratory Systems (1992), 17(1), 95-105
AB An automated chem. workstation is applied to problems in the **synthetic** chem. of porphyrins. A factorial **design** study (16 **expts.**, 96 data points) was performed to examine the role of catalyst and reactant concns. on porphyrin yield. Four expts. could be scheduled to run concurrently; all sixteen expts. were completed in less than 1 day of workstation time. The response surface from this expt. shows the conditions for achieving the highest yield. A simplex **optimization** was performed over the same reaction space, requiring fewer expts. to arrive at the optimal reaction parameters. A strategic search was performed to screen a list of reagents for catalytic activity. The effective concn. range of each catalyst was surveyed by systematic modification of an ongoing reaction. By terminating reactions when a

yield threshold was surpassed or when the entire concn. range had been spanned, compds. with catalytic activity and their effective concn. ranges were identified with minimal experimentation. Automated chem. workstations of this type should yield rapid accelerations in scientific research.

L35 ANSWER 58 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 118:41343 CA
TI Experiment manager software for an automated chemistry workstation, including a scheduler for parallel experimentation
AU Corkan, L. Andrew; Lindsey, Jonathan S.
CS Dep. Chem., Carnegie Mellon Univ., Pittsburgh, PA, 15213, USA
SO Chemometrics and Intelligent Laboratory Systems (1992), 17(1), 47-74
AB A review, with 10 refs., of an automation system with the ability to work relentlessly, precisely, strategically, and autonomously in pursuit of scientific goals. Some years' work has been aimed at developing the hardware and software architecture for an automated workstation. The workstation is **designed** for microscale **experimentation** in relatively clean domains of **synthetic** chem. First, the software system is presented. An expt. manager software package has been developed that provides for compn. of exptl. plans, **controls** all aspects of **automated** experimentation, and manages the data. Expt. manager software is comprised of open-loop and closed-loop expt. planners bundled together with supporting features for timing, scheduling, material data bases, resource management, automated start-up procedures, running display, data handling, configuration options, and maintenance operations. The expt. planners provide a menu-driven user interface, editing features, and a modular set of procedural events with which diverse exptl. protocols can be composed. An overarching objective has been to achieve versatility in expt. planning and still maintain access to the power that parallelism can confer in experimentation. The second theme is a description of approaches to performing expts. in parallel. Parallelism originates chiefly through simultaneous processing of **samples** at semi-autonomous hardware modules, at the user interface, and through the use of a scheduler. The scheduler takes as input a set of exptl. protocols, establishes a sequence of the protocols, and interleaves the exptl. protocols without altering the relative times of the procedures within each protocol. Exptl. throughput can be increased by up to ten-fold by this approach.

L35 ANSWER 60 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 117:233050 CA
TI Microcomputers: bringing the process control laboratory into the classroom
AU De Vaal, P. L.
CS Dep. Chem. Eng., Univ. Pretoria, Pretoria, S. Afr.
SO South African Journal of Chemical Engineering (1992), 4(1), 16-26
AB A discussion is presented on the use of computers in the process control lab. in the Department of Chem. Engineering at the University of Pretoria. Examples are given of available software and of exptl. test app. and how these are used for educational and training purposes.

L35 ANSWER 65 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 115:138732 CA
TI Calo-Visco-Densimeter: a multipurpose apparatus
AU Zhech, Helmut; Knapp, Helmut
CS BASF, Ludwigshafen, D-6700, Germany
SO Chemical Engineering & Technology (1991), 14(2), 109-13
AB A multipurpose app. was designed, built, and operated with the aim of the simultaneous detn. of enthalpy of mixing, heat capacity, kinematic viscosity, and d. of liq. mixts. at 240-370 K and 1-25 bars. The operation of the app. was monitored by a personal **computer**. The **design** and the **exptl**. results were presented.

L35 ANSWER 84 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 107:58093 CA
TI The tin/lead solid/liquid **phase diagram**: a **computer-controlled** experiment
AU Williams, Kathyrn R.; Eyler, John R.; Colgate, Samuel O.
CS Univ. Florida, Gainesville, FL, 32611, USA
SO Journal of Chemical Education (1987), 64(6), 499-500
AB A computer-interfaced detn. of the the solid-liq. **phase diagram** for the Sn/Pb system is described. Construction of the cooling curves (acquisition of thermocouple readings and subsequent plotting) can be performed with the aid of a microcomputer, leaving students adequate time to locate the break and arrest points, **plot** the **phase diagram**, and perform error anal.

L35 ANSWER 85 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 106:129098 CA
TI Pulse radiolysis equipment: a setup for simultaneous multiwavelength kinetic spectroscopy
AU Saran, Manfred; Vetter, Georg; Erben-Russ, Michael; Winter, Robert; Kruse, Alf; Michel, Christa; Bors, Wolf
CS GSF Res. Cent., Inst. Strahlenbiol., Neuherberg, 8042, Fed. Rep. Ger.
SO Review of Scientific Instruments (1987), 58(3), 363-8
AB A **setup** for pulse radiolysis **expts**. is described and consists of the following main components: an array of 15 photomultipliers attached to a spectrograph (allowing 4032 spectra to be recorded with a time resoln. of 500 ns/spectrum), self-regulating high-voltage supply for the photomultipliers, **computer-controlled soln**. mixing and dispensing system, and provisions for continuous dose variation of the FEBETRON-accelerator electron beam. The general performance of the system is discussed and construction or electronic details are given for special components.

L35 ANSWER 90 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 105:174871 CA
TI Automated chemical **synthesis**. Part 4: Batch-type reactor automation and real-time software design
AU Chodosh, Daniel F.; Kamholz, Kenneth; Levinson, Sidney H.; Rhinesmith, Robert

CS Smith Kline and French Lab., Philadelphia, PA, 19101, USA
SO Journal of Automatic Chemistry (1986), 8(3), 106-21
AB The **computer** system, the temp. **control** system, the **liq.** trafficking system, the online chem. anal. system, the stirred-tank reactor, the software, and **exptl. designs** are discussed.

L35 ANSWER 99 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 104:19150 CA
TI Microcomputers in experimental **materials** science
AU Gibeling, Jeffery C.
CS Dep. Mech. Eng., Univ. California, Davis, CA, 95616, USA
SO Comput. Usage Mater. Educ., Proc. Symp. (1985), Meeting Date 1984, 89-99. Editor(s): Liedl, Gerald L.; Sree Harsha, K. S. Publisher: Metall. Soc., Warrendale, Pa.
AB The application of **computer**-based data acquisition and **control** techniques in senior undergraduate and 1st-year graduate level lab. courses is described. Areas of application include **phase diagram** detn., quant. metallog., Hall effect measurements, photocond. expts., creep testing, and conventional tensile testing.

L35 ANSWER 101 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 102:51195 CA
TI **Automatically controlled** measuring-computing complex for studying acoustic properties of matter in a wide range of parameters of state
AU Otpushchennikov, N. F.; Tsyrenov, A. A.; Melikhov, Yu. F.; Mel'nikov, G. A.; Khanarin, V. S.
CS USSR
SO Ul'trazvuk Termodin. Svoistva Veshchestva (1983), 15-21. Editor(s): Otpushchennikov, N. F. Publisher: Kursk. Gos. Pedagog. Inst., Kursk, USSR.
LA Russian
AB An **exptl. setup** is presented for **computer-controlled** study of sound velocity and absorption in **liqs.**, glasses, and polymers in wide temp., pressure, and frequency ranges.

L35 ANSWER 114 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 96:93989 CA
TI A semihierarchic **computer** network for data acquisition and **control** in staircase voltammetry
AU Li, Chia-Yu; Barrett, Thomas H., Jr.; Lunney, David; Salt, Alger
CS Dep. Chem., East Carolina Univ., Greenville, NC, 27834, USA
SO Analytica Chimica Acta (1982), 134, 167-78
AB A simple **computer** system **designed** for **controlling** voltammetric **expts.** was implemented. The system connects a Hewlett-Packard 2100A minicomputer with a Texas Instruments 9900 microcomputer by means of a bidirectional serial transmission link. Exptl. parameters are down-loaded from the host to the satellite which supervises the expts. at a remote location. The data collected are transmitted back to the host at 2400 baud (data rate) for redn. and plotting. Through this division of labor, each system is used to its best advantage. Although the software developed is specifically for staircase voltammetry, the

system hardware is of general-purpose design which is suited for other types of pulse expt.

L35 ANSWER 121 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 91:104620 CA
TI Characterizing chemical systems with on-line computers and graphics
AU Frazer, Jack W.; Rigdon, Lester P.; Brand, Hal R.; Pomernacki, Charles L.
CS Lawrence Livermore Lab., Univ. California, Livermore, CA, 94550, USA
SO Analytical Chemistry (1979), 51(11), 1739-47
AB Incorporating computers and graphics on-line to chem. **expts.** and **processes** opens up new opportunities for the study and control of complex systems. Systems having many variables can be characterized even when the variable interactions are nonlinear, and the system cannot a priori be represented by numerical methods and models. Large sets of accurate data can be acquired rapidly, and then modeling and graphic techniques can be used to obtain partial interpretation plus **design** of further **experimentation**. The experimenter can thus comparatively quickly iterate between experimentation and modeling to obtain a final **soln.** A versatile **computer-controlled** app. was designed and characterized for chem. research, which incorporates on-line instrumentation and graphics. It can be used to det. the mechanism of enzyme-induced reactions or to **optimize** anal. methods. The app. can also be operated as a pilot plant to design control strategies. On-line graphics were used to display conventional plots used by biochemists and 3-dimensional response-surface plots.

L35 ANSWER 135 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 82:158171 CA
TI Instrumentation-oriented microcomputer. Extremely inexpensive data acquisition computer **optimized** for the automated laboratory
AU Woodward, W. Stephen; Ridgway, Thomas H.; Reilley, Charles N.
CS Kenan Lab. Chem., Univ. North Carolina, Chapel Hill, NC, USA
SO Analyst (Cambridge, United Kingdom) (1974), 99(1185), 838-52
AB The design and realization of a versatile, multiaccess, on-line digital **computer** system for instrumentation **design**, **expt. control**, and data interpretation were discussed.

L35 ANSWER 152 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 73:83463 CA
TI Interactive electronic analytical instrumentation based on computerized **experimental design**
AU Jones, David Oldham; Perone, Sam P.
CS Dep. of Chem., Purdue Univ., Lafayette, IN, USA
SO Analytical Chemistry (1970), 42(11), 1151-7
AB A hardware device has been constructed for use in stationary electrode polarographic expts. to automatically **optimize** the exptl. measurements. The basic instrumental parameters were detd. from expts. using a small lab. digital computer on-line. These parameters were then applied to the construction of a hardware device to perform the data anal. and collection, along with exptl. control operations. This allowed the

computing equipment to be freed for use in **exptl. design** while having a device to perform the routine analyses. The device, a simple hybrid computing system using medium-scale integrated circuits, was designed to interact with the expt. in realtime to modify the exptl. parameters and to provide a **sample**-oriented anal. The crit. **exptl. design** parameters elucidated by the software-oriented study are considered and the translation to hardware-oriented instrumentation is described. In addn., the ease with which efficient lab. instrumentation can be designed and constructed as a result of the new integrated circuit electronics technology is demonstrated. The hardware device was evaluated exptl. in the lab. and the capabilities were compared to the software-generated experimentation. Results indicate that essentially identical anal. performance is achieved at greatly reduced complexity of operation and expense. In addn., the hardware-oriented instrumentation provides the capability for greater measurement

L35 ANSWER 175 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 51:69432 CA
OREF 51:12566d-f .
TI Apparatus for differential thermal analysis of lubricating greases
AU Cox, David B.; McGlynn, James F.
CS Socony Mobil Oil Co., Inc., Brooklyn, NY
SO Anal. Chem. (1957), 29, 960-3
AB An app. is described for the investigation of Li soap-oil systems by using differential thermal analysis. The app. operates **automatically** in **controlling heating** rates and recording all pertinent data and differential temps. Five different detns. may be run simultaneously. The design of the cell and thermopile permits high sensitivity and accuracy in locating phase changes. A differential thermal analysis of Li stearate revealed a previously unreported mesomorphic phase occurring between 225°and 229°. A more accurate **phase diagram** than previously reported was obtained of the Li stearate-n-hexadecane system.

L35 ANSWER 180 OF 184 CA COPYRIGHT 2004 ACS on STN
AN 41:11186 CA
OREF 41:2283f-i,2284a
TI Recording viscometer for starches
AU Kesler, C. C.; Bechtel, W. G.
CS Penick & Ford, Ltd., Cedar Rapids, Iowa
SO Journal of Industrial and Engineering Chemistry (Washington, D. C.) (1947), 39, 16-21
AB A continuous-recording viscometer for routine and research testing of starch products is described. Variations in cooking procedures which cause errors in η detns. are prevented through **automatic control** of **heating**, max. **temp.**, rate of stirring, and loss of water by evapn. η is measured as the force which the paste exerts against a propeller driven through it at const. speed. A gear differential transmits the force to a dynamometer attached to the pen arm of the recorder. Interchangeable wts. on the dynamometer permit measurements in several ranges with equal sensitivity and without requiring recalibration of the

viscometer. **Viscosities** of one poise or more can be measured throughout any desired length of time, and during both heating and cooling periods. Variations between samples and differences between com. types of starch can be readily observed. Starches from different sources and of different kinds and degrees of modification give characteristically different curves which are of value in their identification and study. Results of 75 detns. in duplicate made by the same operator show the precision to be expected is within □%. Where a single starch was tested by different operators in different labs. the degree of precision was approx. □%. Studies of sensitivity with a **concn**. of 5% of unmodified corn starch as the control showed that to avoid errors due to measurement of samples the starch should be weighed to within □.05 g. and the water measured to within ±1 ml. The vol. of the starch soln. may be varied by as much as 100 ml. without affecting the readings. Design of the agitator permits measurement of η up to about 55 poises; this covers the range from 3% unmodified tapioca or potato starch or 4% unmodified corn starch to 6.5% tapioca or 9 to 10% cornstarch.

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